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Preventing Army Motor Vehicle Accidents



May 1990

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A Message from the Chief of Transportation

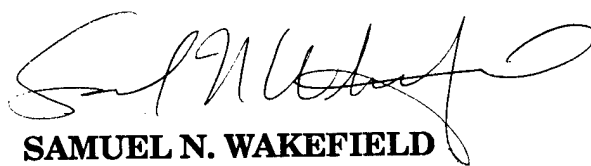
Army motor vehicle (AMV) safety is an issue of vital and long-standing concern to all commanders and leaders who use AMVs to accomplish their training and combat missions. In today's Army, one of our most difficult challenges is to provide demanding, realistic training while limiting the degree of risk involved. And, quite clearly, vehicle accident prevention is essential to our ability to deploy and sustain warfighting forces on the modern battlefield.

During the past few years, we have made significant headway in our efforts to equip both our active and reserve forces with the most modern systems available. Additionally, we have made steady progress in reducing AMV accidents and the associated injuries, fatalities, and equipment losses.

If we are to maintain this momentum, we must necessarily increase our focus on accident prevention at all levels. First, we must train our operators to understand fully the capabilities and limitations of their vehicles. Secondly, commanders must ensure that sound safety procedures are integrated into every facet of their unit's operations.

To be fully successful, unit AMV accident prevention programs must be both comprehensive and proactive. We have a great responsibility—to ourselves, to our soldiers, and to the Army—to make sure that all soldiers place proper emphasis on vehicle safety.

It is my hope that this pamphlet will serve as a valuable tool in your efforts to enhance your AMV accident prevention programs.



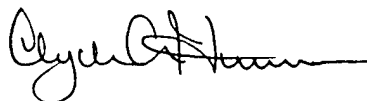
SAMUEL N. WAKEFIELD
Major General, U.S. Army
Chief of Transportation

Foreword

In recent years, we have made steady progress in reducing Army motor vehicle (AMV) accidents. However, they are still a serious drain on Army combat readiness. The record shows that improving safety in AMV operations pays off not only in reduced fatalities, injuries, and accident costs but also in increased readiness.

This pamphlet is targeted at the most frequent causes of AMV accidents. It provides accident causes and cures specific to those vehicles that account for a large number of AMV accidents. Any future improvements in the AMV accident record will be directly related to the prevention emphasis you place on AMV operations in your unit. This pamphlet will help.

The Army Safety Center is interested in user reaction to this pamphlet. Your comments on its usefulness and suggestions for improving its content are welcome. Please use the pre-addressed mailer at the back of the pamphlet to let us hear from you.



C. A. Hennies
Brigadier General
Commanding General
U.S. Army Safety Center

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Section I

AMV Accident Facts

Driver error

Driver error is the single greatest cause of Army motor vehicle (AMV) accidents. In most cases the driver failed to do something according to standard or did something that wasn't up to standard. The reason he made the error, however, could have been lack of training, lack of established standards, or failure to follow procedures.

There are four major reasons for driver error. They are—

- **Standards failure.** When standards are not clear, not practical, or do not exist, and a driver makes an error, that error is the result of standards failure—failure to establish standards.

- **Training failure.** If standards exist and the driver has an accident because he does not know the standards or does not know how to achieve them, we have a training failure.

- **Leader failure.** Where standards exist and are known but leaders fail to enforce them, driver error is the result of leader failure.

- **Individual failure.**

When standards are known but are not followed—when the driver fails to perform to established and enforced performance standards—then we have individual failure.

To prevent driver-error accidents,

units must ensure that they know the standards, train to the standards, and enforce the standards. If standards don't exist, they must be developed.

The U.S. Army Transportation School has developed a generic driver training manual, FC 55-32: Driver Selection, Training, and Supervision in Units—Tactical Wheeled Vehicle Operator, to assist unit commanders in conducting driver training. The Transportation School also has revised AR 600-55: Motor Vehicle Driver/Equipment Operator Selection, Training, Testing, and Licensing and is developing guidance for standardized unit driver training. In addition, the U.S. Army Training and Doctrine Command (TRADOC) is working to integrate safety into all Army training.

Materiel failure/malfunction

Inadequate preventive maintenance accounts

**Army Motor Vehicle Accidents
FY 1985-1989**

FY	Number	Fatalities	Lost Workdays	Cost
85	3,473	36	12,066	\$19,060,000
86	3,330	44	13,438	\$19,451,000
87	2,880	28	7,648	\$17,943,000
88	2,552	25	8,036	\$21,224,000
89	1,592	23	6,292	\$17,353,000

for most AMV materiel failure/malfunction related accidents. Faulty brakes are the largest single contributor to maintenance-related accidents, especially in 2½- and 5-ton trucks. The brake components reported as failing most often are brake lines, air hydraulic cylinders, parking brakes, wheel cylinders, and master cylinders.

Safety belts

Nearly all tactical vehicles now have, or soon will have, safety belts. The increased

availability and use of safety belts have been accompanied by a steady decrease in the number and severity of injuries in AMV accidents. However, a few individuals have chosen not to wear safety belts, and some of them have already learned their lessons the hard way, in the hospital.

Leaders must enforce the requirement that vehicle occupants use available safety belts. Personnel losses that can be prevented this easily are inexcusable.

Section II

Commander's Guide to Accident Prevention Planning

Commanders must take the initiative in making safety just as much a part of being a vehicle operator as preventive maintenance. How can you do this in your unit?

Identify the problems

Find out what causes the most accidents in your unit. (You'll probably find the same ones that are discussed in this pamphlet.) Do this by answering the following questions.

- What kinds of accidents happen in your unit?
- How often do they happen?
- When do they happen?

Analyze the problems

Find the "why" behind the accident. For example, if a driver loses control of his vehicle when driving too fast for the existing conditions, it's not enough just to blame his failure to reduce speed. Ask yourself the following.

- Was the driver trained in all unit SOPs?
- Were the SOPs routinely enforced?
- Had the driver received thorough training in the operation of the particular vehicle, including emergency procedures?
- Were safety-critical components inspected for proper maintenance?

- Were drivers briefed on special considerations such as terrain and weather?

Prevent the problems

Determine what you can do to prevent the problems. Here's a short list of ideas to get you started.

- Give additional training for adverse weather conditions or unusual terrain (ice, snow, mud, potholes).
- Develop emergency procedures for sudden stops or swerves by other drivers and for vehicle problems such as blowouts, brake failure, and loss of steering. Ensure personnel are trained in the procedures and receive periodic refresher training.
- Train drivers to move safely in areas with little clearance.

Safe operations don't just happen. They result from careful planning. Applying the principles of risk management, develop your plan and put it to work. Then constantly analyze it. See how your drivers respond to it. See if it reduces or gets rid of your safety problems. If it does, keep refining it to make it even more effective. If it doesn't, try a new plan. But in any case, remember—your safety plan should not be just temporary. Write it

down and distribute copies to your NCO leadership. Keep it working.

Sample prevention plan

Problem. An MP company was constantly having its vehicles deadlined because of accidents, mostly of the "fender bender" variety. The commander stated that if accidents weren't reduced, the MPs would be patrolling on foot—partly to eliminate the accident source but mainly because there soon wouldn't be any mission-capable MP sedans left. The accidents were occurring during routine patrol operations at normal speeds while turning, backing, and following.

Analysis. Unit leaders found that the principal cause factor was simply that most of the MPs did not have all the skills they needed to operate the vehicle.

Prevention plan. Unit leaders developed the following plan to solve the problem. The plan was to be given a 3-month trial to see if it reduced vehicle accidents. If it did, it would be refined to improve results; if it didn't, a new plan would be developed.

- Establish a hands-on practice course to test driving skills, including backing and turning, and to provide remedial training as appropriate.

- Hold a monthly safety committee meeting to discuss the month's accidents, identify causes, and plan countermeasures.

- Conduct weekly 5-minute safety briefings for all personnel and post bulletin board notices reporting causes of and preventive measures for accidents as they occur.

- Establish an awards program to recognize drivers for 12 months of accident-free driving.

Section III

Ground Guide

Safety Procedures

Ground guides are a safety essential. But to be of value, they must know what they're doing. Their own lives and the lives of others depend on their knowing when to ground guide as well as *how* to ground guide. Following are some guidelines.

- Ground guides are required when vehicles enter bivouac areas. They should dismount at the site entrance and begin ground guiding. The best method to guide a vehicle at night into a bivouac area is to stop the vehicle, move forward to be sure the way is clear, then signal the vehicle to move forward. As the vehicle advances forward, repeat the process.

- Before a vehicle is started in an assembly area, a member of the crew must walk completely around it to ensure no one is in danger from the vehicle's movement.

- During movement within or through an assembly area, large vehicles require ground guides front and rear. Guides must be able to see each other, and one must be visible to the driver.

- Backing will normally require one ground guide; however, two guides will be used when visibility is restricted (cargo, darkness, etc.).

- Hand signals are the basic method used for ground guiding. Voice signals between a ground guide and driver can be misunderstood.

Basic rules

- Keep 10 yards between ground guides and vehicles.

- Give signals to only one person. When more than one ground guide is necessary, the front guide is normally in the best position to give signals. Be sure that everyone involved in a move—the driver and other ground guides—understands who will give the signal and who will receive it.

- Remain out of the vehicle's path of travel. If you must be in the path of travel, maintain a distance of at least 10 yards.

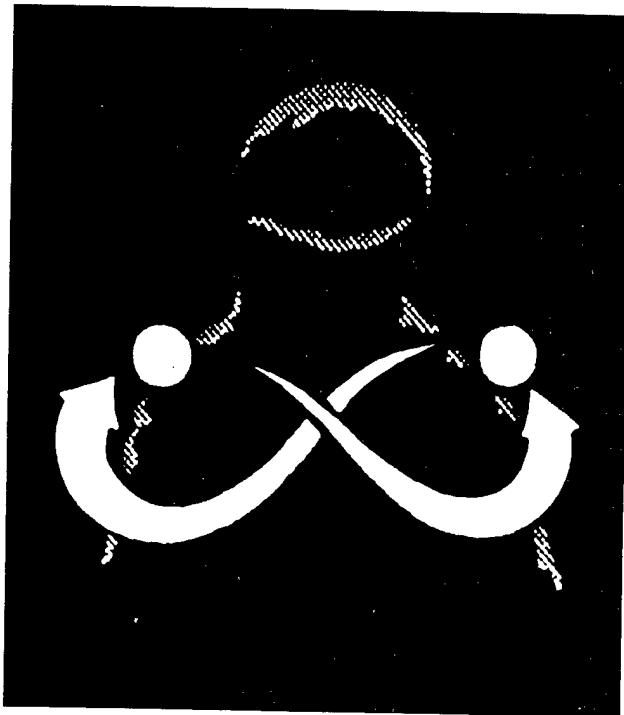
- If you are guiding a vehicle into a close position and cannot maintain a 10-yard forward distance, keep to the side and front (or rear) of the vehicle or get on top of the object (i.e., another vehicle or dock) you are approaching. In all cases, stay in the driver's line of sight.

- When guiding a vehicle long distances, your best position is forward and to the left of the vehicle.

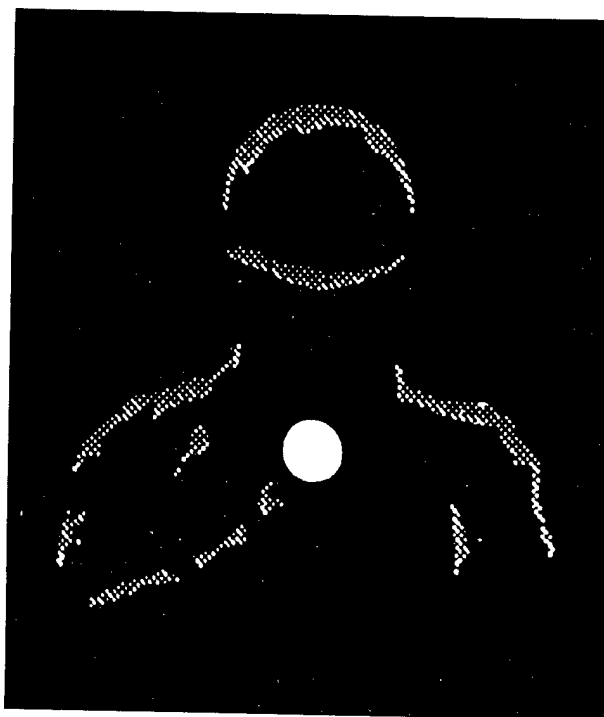
- Never walk backwards to guide a vehicle. Instead, locate yourself 10 to 20 meters behind the vehicle and face the ground guide located in front of it. Once the vehicle backs to your initial location, stop it, turn around, and walk forward another 10 to 20 meters. Turn around and face the vehicle and the front ground guide and continue guiding in this manner until the vehicle is in position.

Light signals

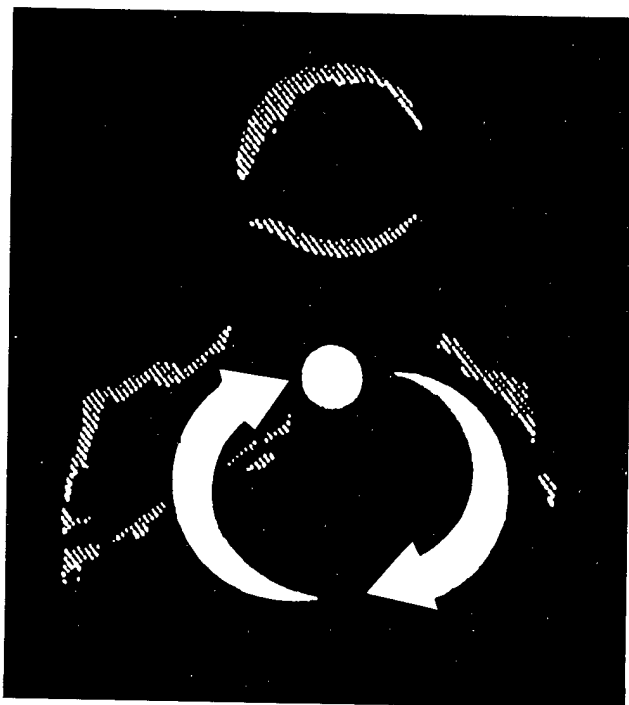
Red filters on light signals will help protect night vision. Use them when possible.



Start engines. Move the light to describe a horizontal figure-8 in a vertical plane in front of body.

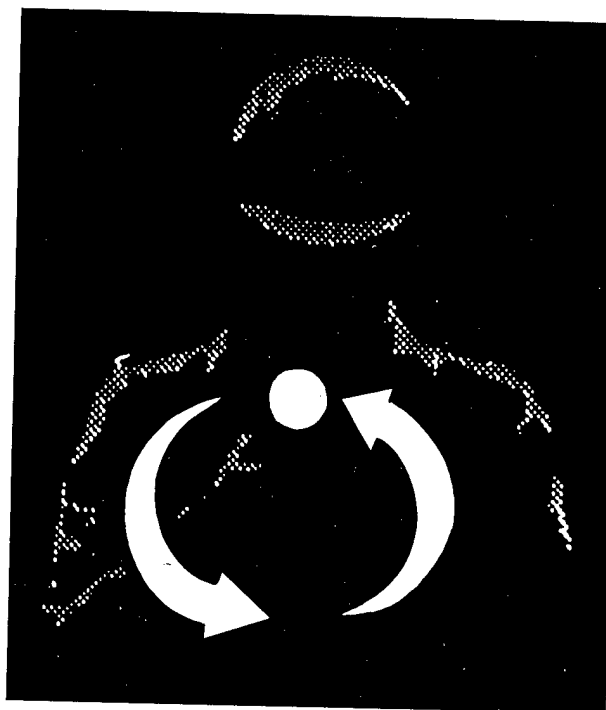


Move in reverse (for stationary vehicle) or **slow down** (for moving vehicle). Hold light at shoulder level; blink several times toward vehicle.

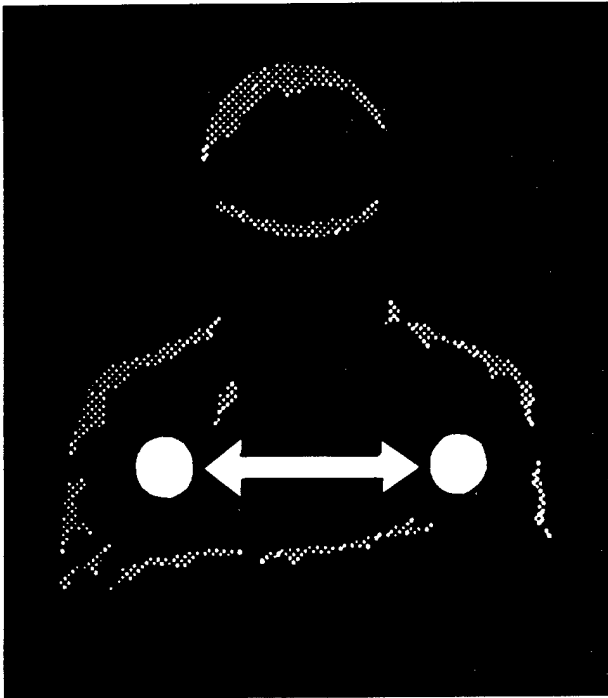


Turn right.

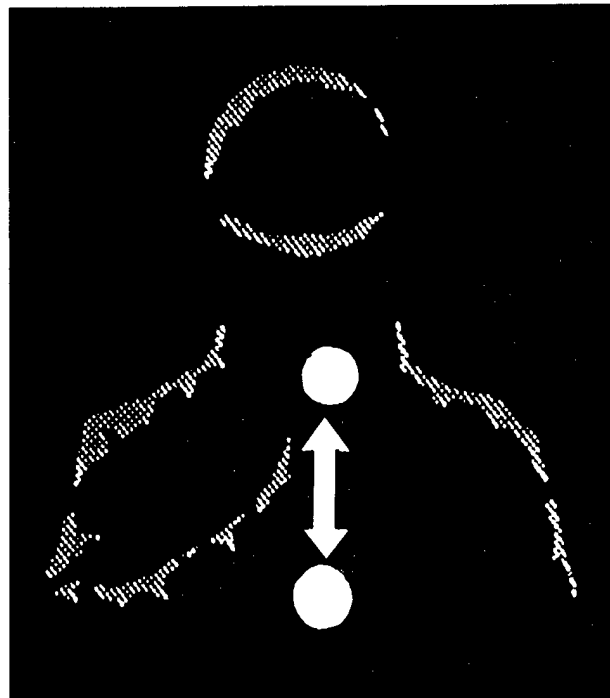
Turn right or left. Rotate light in a circle 12 to 18 inches in diameter in the desired direction of the turn.



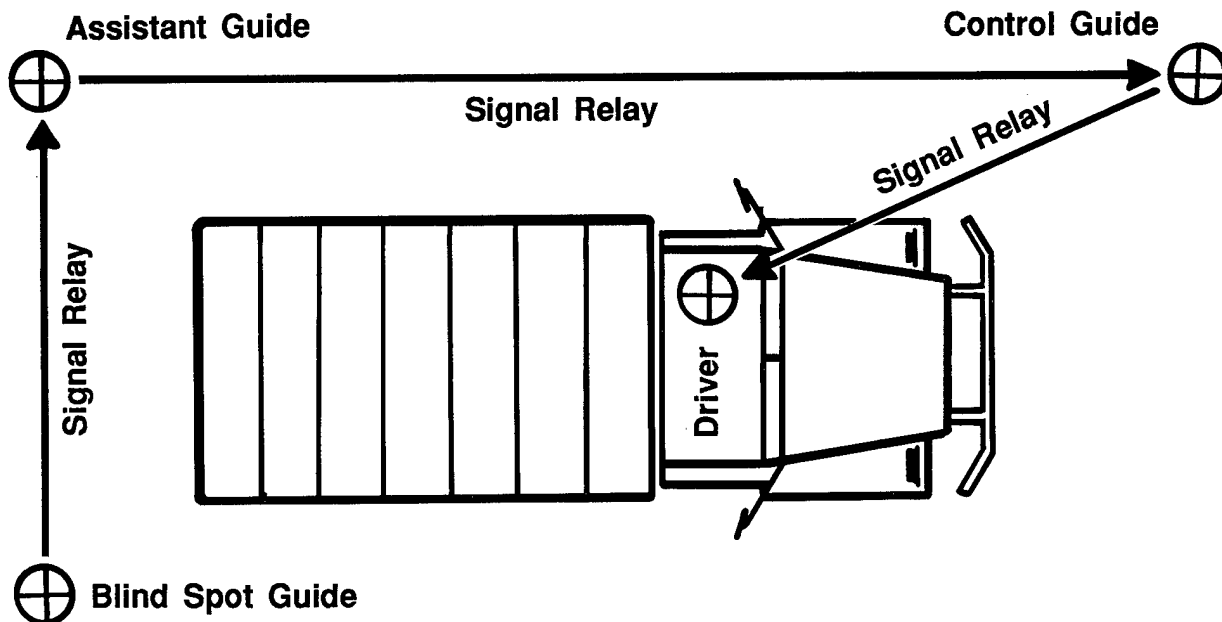
Turn left.



Stop movement or stop engine. Move light horizontally several times across traffic path to stop vehicle or stop engine.



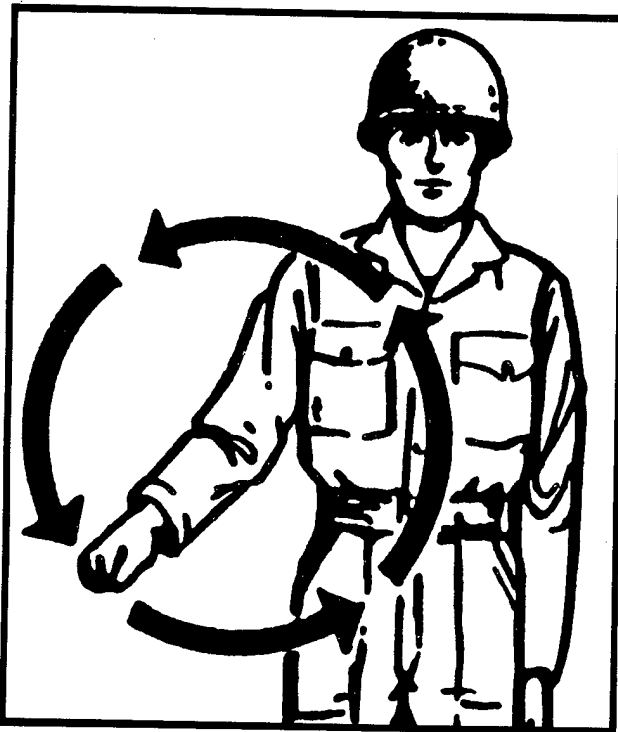
Forward—move out, go, increase speed, or double time. Move the light vertically several times in front of the body.



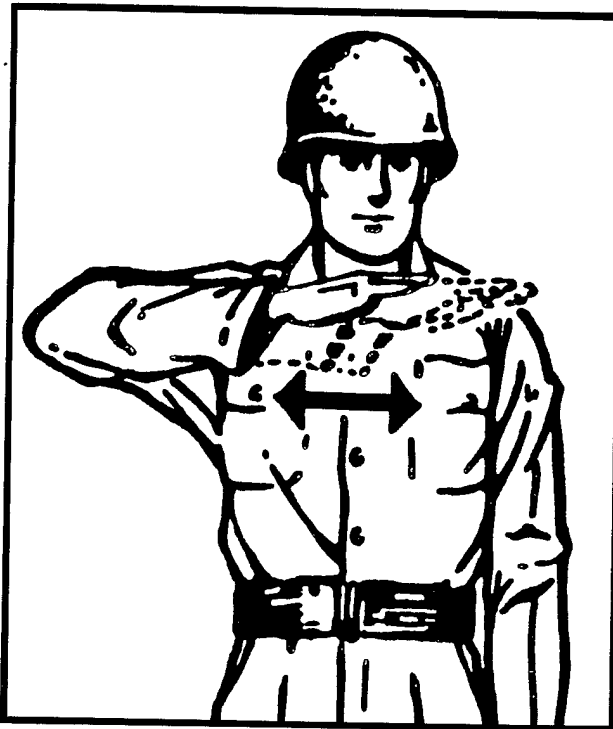
Recommended Ground Guide Positions

Hand signals

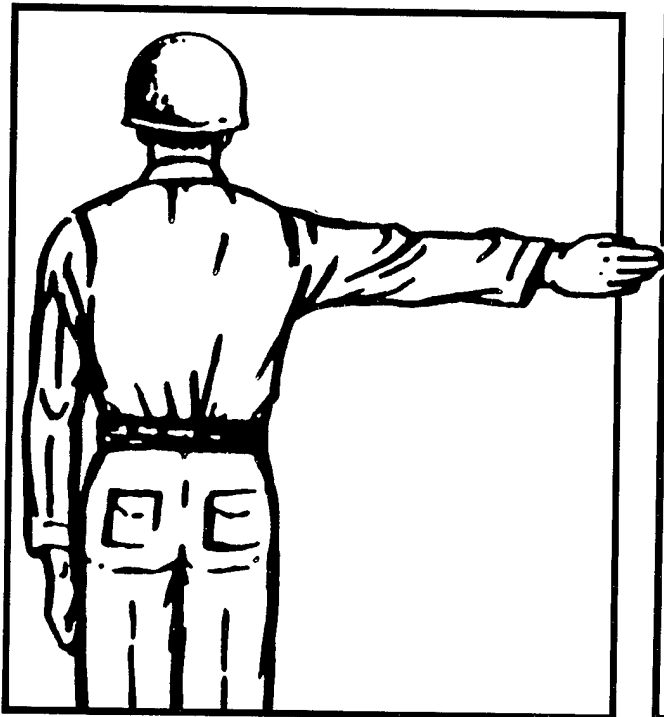
All soldiers who act as ground guides should know and be able to perform these standard hand signals. All drivers should understand the meaning of the signals.



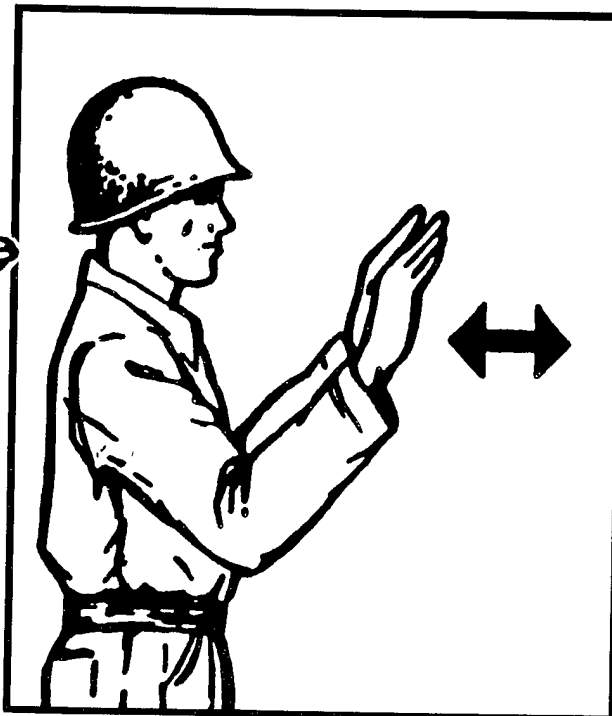
Start engine or prepare to move. Simulate cranking of engine by moving arm in a circular motion at wrist level.



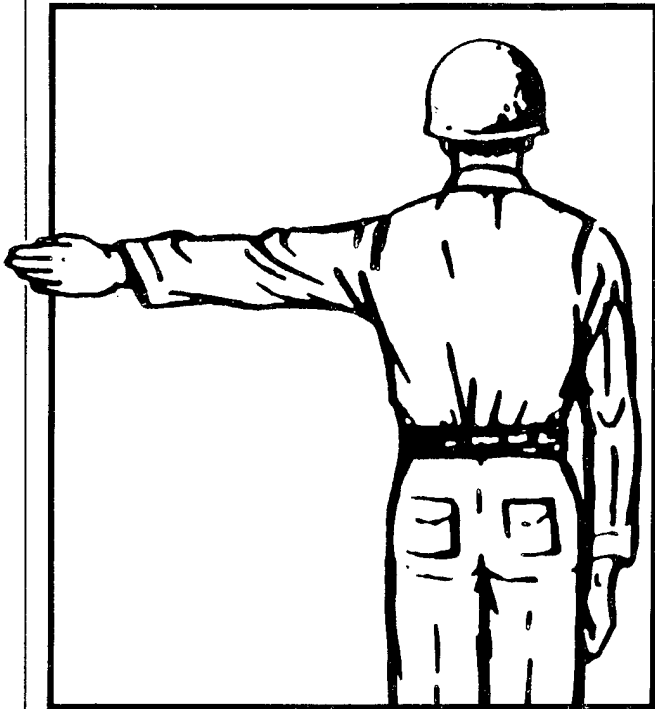
Stop engine. Draw right hand, palm down, across the neck in a "throat cutting" motion from left to right.



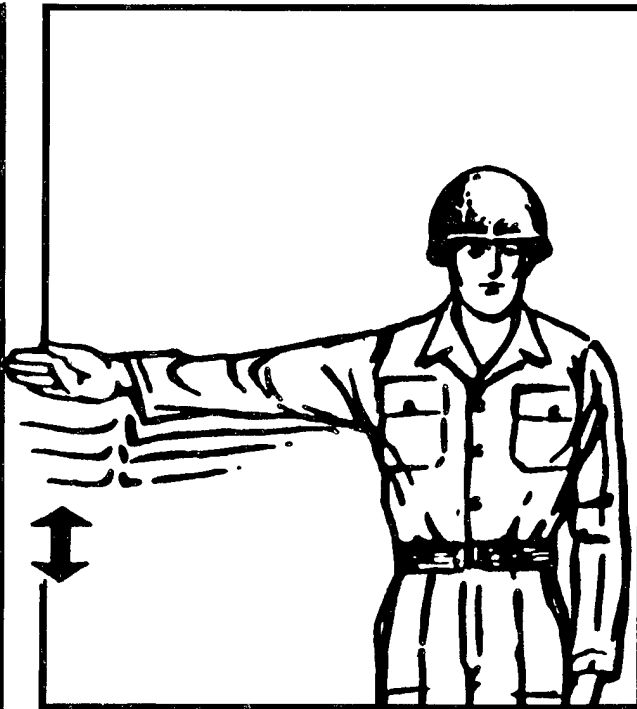
Turn right. Extend right arm horizontally to the side, palm to the front.



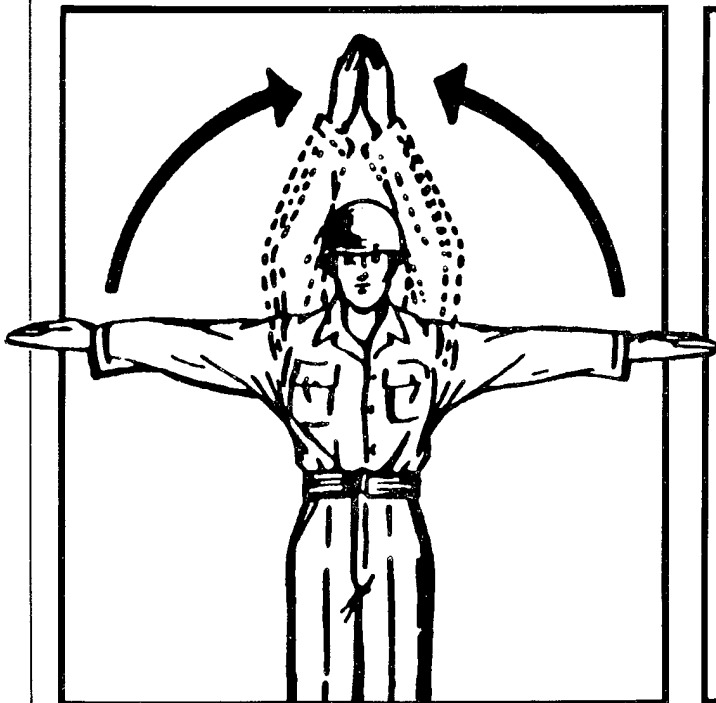
Move in reverse (back up). With hands raised and palms facing front, move hands forward and back as if pushing vehicle away.



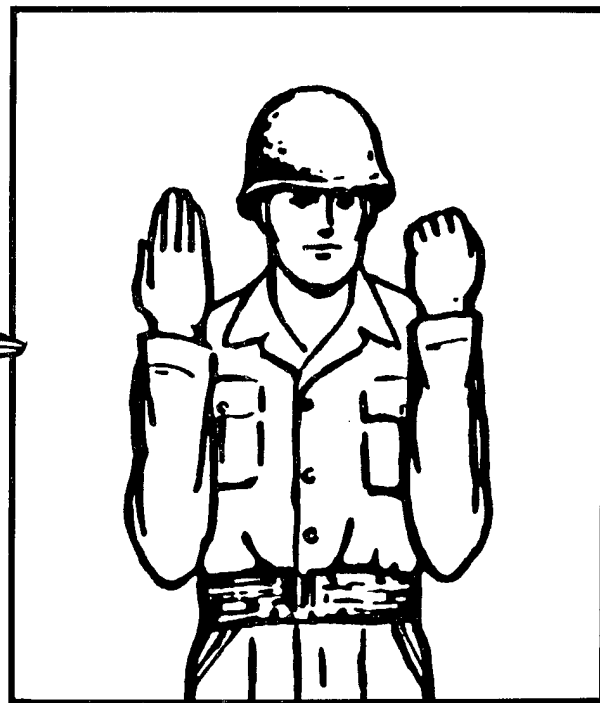
Turn left. Extend left arm horizontally to the side, palm to the front.



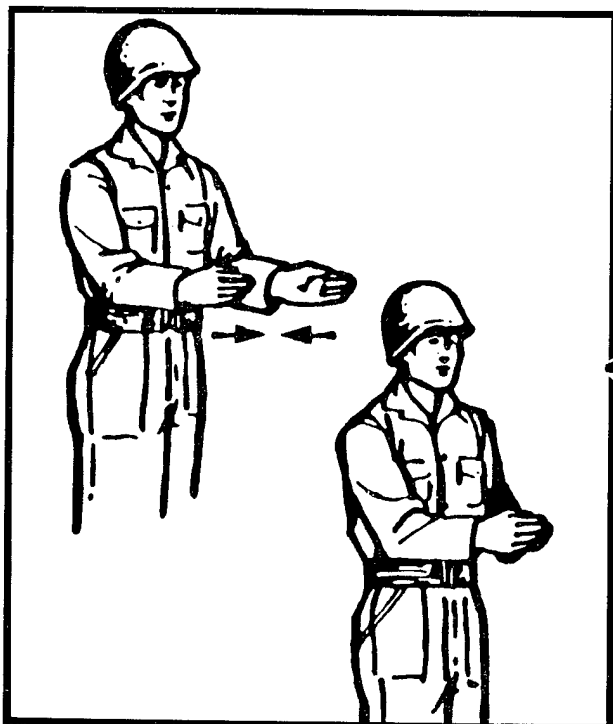
Decrease speed. Extend arm straight out sideward, palm front; wave arm down and back to horizontal several times.



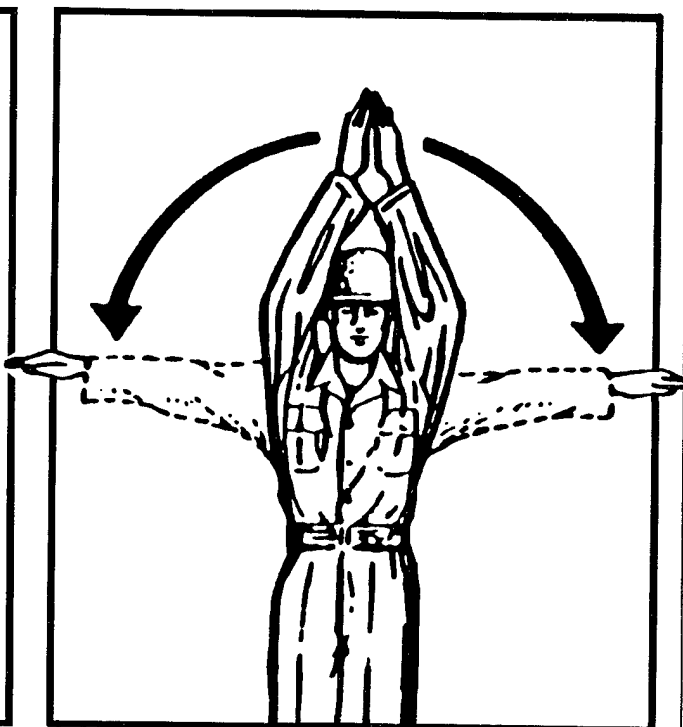
Extend or open up. Extend arms overhead, palms together; bring arms to horizontal at the sides, palms down. Return arms along front of body to overhead position and repeat signal until understood.



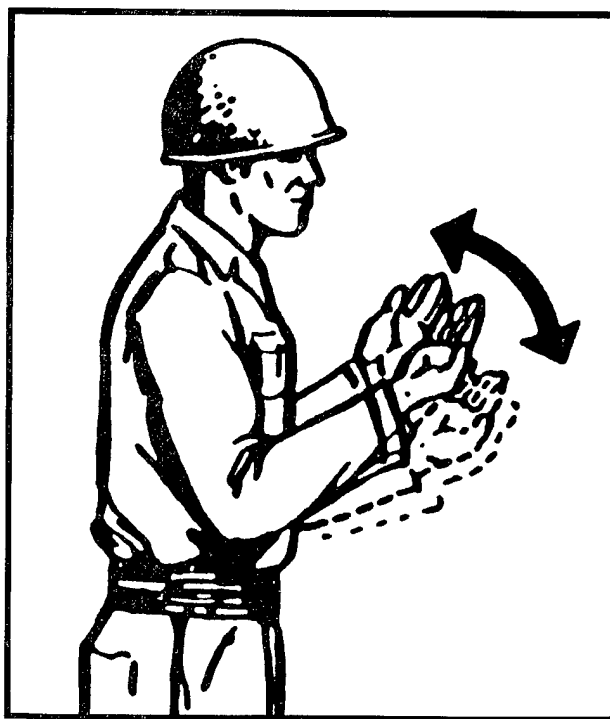
Change direction. Bend elbows to bring hands to front of shoulders. Clench fist on arm in direction of turn. With other arm, make beckoning or pushing motion to bring vehicle forward or back.



Close up distance between vehicles and stop. Face vehicle and extend forearms to front, palms separated by width of shoulders. Bring palms together as distance shortens. Vehicle must stop when palms come together.



Close up. Extend arms sideward, palms up; bring palms together overhead momentarily. Return arms along front of body to sideward position and repeat signal until understood.



Move forward. Move hands backward and forward with palms toward the chest as if pulling the vehicle.

Section IV

Checklist for

Convoy Operations

in CONUS

As a safety officer or NCO, your duties include ensuring that convoy operations in your unit meet all safety regulations. To do this, you must gather information from personnel responsible for convoy operations. This checklist will help you in gathering that information.

The checklist consists of 13 topics relating to convoy operations in CONUS. The first sentence under each topic will tell you whom to ask the questions.

Route selection

Ask the convoy commander or convoy planner these questions.

- ☐ Has map reconnaissance been completed?
- ☐ Has a physical reconnaissance been made of the entire route?
- ☐ Can all vehicles clear bridges, underpasses, tunnels, and other overhead clearance limits? If not, have alternate routes been selected?
- ☐ Can all vehicles maintain minimum speed limits? If not, have alternate routes been selected?
- ☐ Have urban or potentially congested areas been identified?
- ☐ To avoid congestion, have alternate routes been selected?
- ☐ Has convoy movement been planned to avoid peak traffic periods?
- ☐ Have alternate routes been selected for vehicles transporting oxygen, acetylene, or other compressed gases?
- ☐ Have strip maps of the entire route been prepared?
- ☐ Does each convoy vehicle have a strip map?

Start and release points

Ask the convoy commander or convoy planner at battalion level these questions.

- ☐ Is adequate space available for vehicle organization and lineup at start point?
- ☐ Is sufficient space available for maneuvering of vehicles, sequential lineup of vehicles, and march units and serials?

- ☐ Has arrival time at release point been established?
- ☐ Is adequate space available for safe vehicle release?

Civilian police assistance

Ask the convoy commander or convoy planner these questions.

- ☐ Have the following areas requiring civilian police assistance been identified?
 - ☐ Major intersections.
 - ☐ Entrances and exits of expressways and main routes.
 - ☐ Urban or congested areas.
 - ☐ Entrances and exits of rest halt areas.
- ☐ Has civilian police assistance been requested for these critical areas through Military Police channels?
- ☐ Has an advance party been designated and briefed to coordinate with the civilian police?

Controlled-access highways

If convoy movement will take place on controlled-access highways (those where entry and exit is permitted only at specific points), ask the convoy commander or convoy planner these questions.

- ☐ Have halt areas been identified along the route?
- ☐ Has a 15-minute halt been scheduled after the first hour, and 10-minute halts every 2 hours thereafter?
- ☐ Are all halts planned in designated rest areas?
- ☐ Have all halt areas been physically reconned to ensure sufficient capacity?
- ☐ Are halt areas shown on strip maps?
- ☐ Are halts scheduled to avoid overloading of halt areas?
- ☐ Do areas for meal halts contain the following?
 - ☐ Sufficient areas for cooking and eating?
 - ☐ Waste disposal facilities?
 - ☐ Latrines?
- ☐ Do bivouac sites contain the following?
 - ☐ Sufficient area for cooking, eating, and sleeping?
 - ☐ Waste disposal facilities?
 - ☐ Latrines?
 - ☐ Area for vehicle maintenance?
 - ☐ Security for cargo?

Conventional highways

Ask the convoy commander or convoy planner these questions.

- ☐ Have halt areas been identified along the route?
- ☐ Has a 15-minute halt been scheduled after the first hour, and 10-minute halts every 2 hours thereafter?
- ☐ Are halt times adjusted to permit halts at safe locations?
 - ☐ Location is away from urban or heavily congested areas.
 - ☐ Terrain permits vehicles to completely clear highway traffic lanes.
 - ☐ Location avoids curves or reverse sides of hills (blind spots from approaching vehicles).
 - ☐ Location permits minimum of 3 feet between parked vehicles.
- ☐ Are halt areas shown on strip maps?

Convoy organization

Ask the convoy commander or convoy planner these questions.

- ☐ Are convoys of more than 20 vehicles separated into serials?
- ☐ Are serials divided into march units if required?
- ☐ Is convoy element size based on capacity of halt/bivouac areas?
- ☐ Have the following personnel been designated and briefed?
 - ☐ Commanders for each serial and march unit.

- ☐ Pace setter.
- ☐ Trail party.
- ☐ Claims officer.
- ☐ Are vehicles transporting troops not the last vehicle in a serial or march unit?
- ☐ Are empty vehicles or those carrying general cargo used as buffers?
- ☐ Is the convoy organized initially with 5 minutes between march units and 10 minutes between serials?
- ☐ Have adjustments to time gaps been identified and planned for?
- ☐ Are convoy and convoy element commanders positioned for best convoy control?
- ☐ Has the convoy been scheduled to operate no more than 12 hours per 24-hour period?
- ☐ Has convoy operation during periods of darkness been avoided?
- ☐ Are the following proper vehicle intervals planned?
 - ☐ Controlled access highway—200 yards.
 - ☐ Rural conventional highway—150 yards.
 - ☐ Urban conventional highway—50 yards.
- ☐ Does each driver have a route map?
- ☐ Is the convoy commander's checklist completed?

Control vehicle/convoy ID and communications

Ask the convoy commander or convoy planner these questions.

- ☐ Are lead, rear, and element commander vehicles identified by flags and signs in accordance with AR 55-29 and AR 746-1?
- ☐ Are flags and signs correctly mounted on each vehicle?
- ☐ Is each convoy identified by a convoy clearance number?
- ☐ Is the convoy clearance number correctly mounted on vehicles?
- ☐ Has method of communication been decided?
- ☐ Has radio equipment (ideally, 2-way radio in first and last vehicle of each serial and unit) been checked and assigned to vehicles?
- ☐ Have signal operating instructions been provided to vehicles with radios?
- ☐ Have personnel been briefed on visual and audio signals?
- ☐ Have road signs and messages been constructed and placed as required?

Logistical support

Ask the convoy commander or convoy planner these questions.

- ☐ Are medical personnel scheduled and posted in rear of convoy?
- ☐ Are sufficient food and mess personnel and facilities available?
- ☐ Do all personnel have proper clothing and equipment?
- ☐ Has weather briefing been obtained for duration of convoy operation?
- ☐ Have provisions been made for obtaining weather updates?
- ☐ Is special equipment available based on weather requirements?
- ☐ Have weather effects been determined and planned for on halts, meals, and bivouacs?

Convoy personnel briefing

Ask ONLY the convoy commander these questions.

Have supervisory personnel received the following instructions?

- ☐ Permit truck parking areas only on controlled access highway.
- ☐ Permit emergency halts only on roadside of controlled access highways.
- ☐ Permit only guards and maintenance personnel on traffic side of convoy during halts on conventional highways.
- ☐ Drivers and assistant drivers perform vehicle operation maintenance and check cargo security at every stop.
- ☐ Have guards stand 50 yards behind departing convoy to warn traffic on conventional highways.
- ☐ Vehicles must be off highway before beginning maintenance.
- ☐ Reflectors and warning devices must be in place before beginning maintenance.

- ☐ Warning lights are used during periods of darkness or low visibility.
- ☐ Convoy begins only at convoy commander's signal.
- ☐ All drivers have a minimum of 8 hours rest within 12 hours after departure.
- ☐ In case of accident, main column does not stop to provide assistance. Next following vehicle provides immediate assistance to accident vehicle.
- ☐ If an accident occurs to vehicle ahead, make maximum effort to clear traffic lanes.
- ☐ First officer or NCO at accident scene takes charge.
- Have drivers received the following instructions?**
 - ☐ Always follow civilian police instructions when given.
 - ☐ Use truck parking areas only on controlled-access highways.
 - ☐ Make emergency halts only on roadside of controlled-access highways.
 - ☐ Do not stand on traffic side of a convoy during halts on conventional highways. (Only guards and maintenance personnel may do so.)
 - ☐ Perform vehicle operation maintenance and check cargo security at every halt.
 - ☐ Move vehicles off highway before beginning maintenance.
 - ☐ Have reflectors and warning devices in place before beginning maintenance.
 - ☐ Use warning lights during periods of darkness or low visibility.
 - ☐ Begin convoy movement only at convoy commander's signal.
 - ☐ Lead vehicle speed restrictions:
 - ☐ Maximum 50 mph on controlled-access highway.
 - ☐ Prevailing speed limit or 40 mph, whichever is less, on conventional highways.
 - ☐ Vehicle intervals (minimums):
 - ☐ Controlled-access highway—200 yards.
 - ☐ Rural conventional highway—150 yards.
 - ☐ Urban conventional highway—50 yards.
 - ☐ Maintain close interval until reaching main convoy route.
 - ☐ Use acceleration lane, when available, to reach convoy speed.
 - ☐ Gradually attain proper vehicle interval once on main convoy route.
 - ☐ Take a minimum of 8 hours rest within 12 hours of departure.
 - ☐ Drive with windows and vents open to prevent fatigue (weather permitting).
 - ☐ In case of accident, main column does not stop to provide assistance. Next following vehicle provides immediate assistance to accident vehicle.
 - ☐ If an accident occurs to vehicle ahead, make maximum effort to clear traffic lanes.
 - ☐ Operate all vehicles with headlights on at all times.
 - ☐ Use warning devices correctly.

Refueling and maintenance halts

Ask the convoy planner these questions.

- ☐ Are sufficient supplies of gasoline and oil available for refueling?
- ☐ Are refueling halts planned for bivouacs?
- ☐ If not, is refueling planned for noon meal halt?
- ☐ Have vehicle operator maintenance checks been scheduled for every halt?
- ☐ Are sufficient maintenance vehicles and equipment available in rear of convoy?
- ☐ Are spare vehicles available for emergencies?
- ☐ Are all vehicle refuelers properly equipped and trained?

Vehicle preparation and loading and unloading

Ask the convoy planner these questions.

- ☐ Have participating units been notified as much in advance as possible?
- ☐ Have all vehicles (including replacement vehicles) been inspected in vehicle assembly area?
- ☐ Have all spot corrections been made on vehicles?
- ☐ Does the loading and unloading plan include—
 - ☐ Designation of persons to execute plan?
 - ☐ Times and locations for loading and unloading?

- ☐ Orders not to load troops in vehicles with motor fuel or hazardous cargo?

Driver preparation

Ask the unit or convoy commander these questions.

- ☐ Are all drivers qualified in assigned vehicles?
- ☐ Are drivers and assistant drivers assigned to each vehicle?
- ☐ Do all drivers have government drivers license SF 46?
- ☐ If not, have arrangements been made to test drivers or obtain alternate drivers?
- ☐ Are experienced drivers being used to the maximum extent possible?
- ☐ If not, are less experienced drivers scheduled for training?
- ☐ Have drivers and assistant drivers been scheduled to split driving periods?
- ☐ Are drivers and assistant drivers scheduled for 8 hours rest per 10 hours of driving in each 24-hour period?

General precautions and procedures

Check these items yourself or ask the convoy commander.

- ☐ Are warning signs on first and last vehicle?
- ☐ Is a basic convoy warning kit in each vehicle?
- ☐ Are fire extinguishers, axes, and first aid kits in vehicles IAW AR 55-29?
- ☐ Are vehicles carrying hazardous material marked IAW AR 55-29?
- ☐ Do road guides have safety warning equipment IAW AR 55-29?
- ☐ Are maintenance, wrecker, and recovery vehicles marked IAW AR 55-29?
- ☐ Are accident procedures for the convoy established to include—
 - ☐ Availability of AR 385-40, DA Form 285, and state safety regulations?
 - ☐ Trail officer designated to supervise care of injured and disposition of damaged vehicles?
 - ☐ Notification of convoy commander, safety officer, and civilian police of accidents?
 - ☐ Reporting of accidents IAW AR 385-40?

Section V

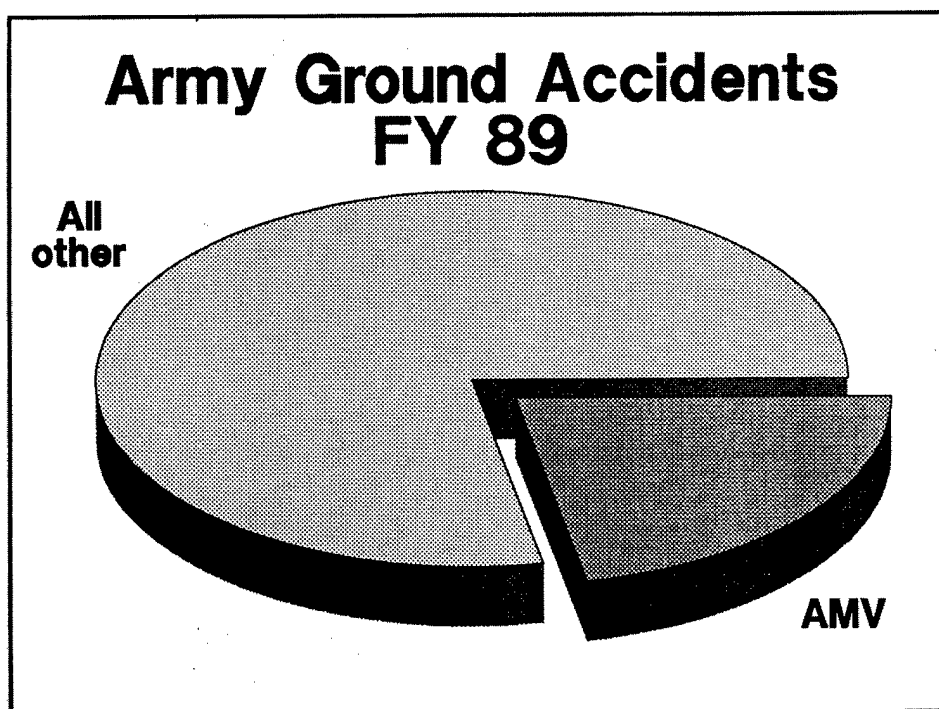
Accident Causes and Cures

The Army's peacetime AMV accident experience suggests the existence of operational weaknesses that would produce even greater losses in combat. Based on problems that have caused AMV accidents in the past, this section is intended to provide the perspective needed to prevent these kinds of accidents in the future.

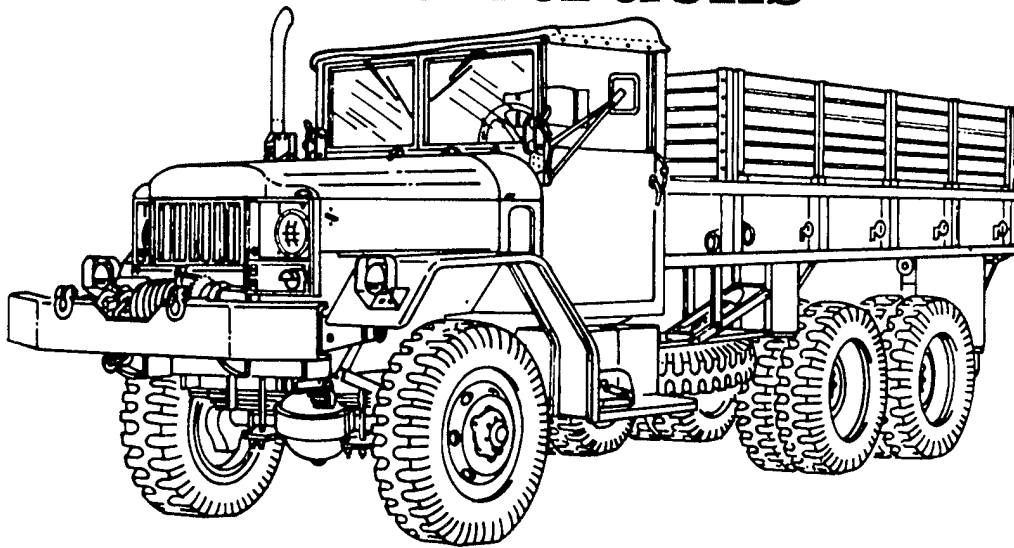
There are no new AMV accidents, just new victims. Year after year, we continue to suffer losses from the same causes in the same types of vehicles. The numbers might change, but the leading causes don't. Knowing the facts can provide insight and direction for AMV accident prevention programs

Improving safety

in AMV operations can provide the greatest single safety payoff in reduced accident costs and injuries. Any future improvements in the AMV accident record will be directly related to the use we make of those past records of costly experience and lessons learned.



2¹/₂- and 5-ton trucks



The versatile M44 series, M809, and M939 series trucks are designed to haul or tow almost anything the Army has that can be moved. They also have been used as a weapons platform to provide convoy security in combat.

Failure to follow procedures

One failure to follow procedures that calls for strong command action is disregard of the requirement to wear safety belts. Drivers backing 2¹/₂- and 5-ton trucks without the aid of a ground guide is another. These vehicles are big, and the driver's rearward visibility is limited; a ground guide is essential for all safe backing operations. A word of caution: The ground guide should never place himself between the backing vehicle and another object.

Inadequate PMCS

Before operating any vehicle, drivers must inspect it to ensure that it is mechanically safe to drive. Each year 2¹/₂- and 5-ton trucks are involved in approximately 100 accidents from loss of brakes. Most of these could have been prevented by proper PMCS.

Failure to maintain control

The driver must be alert to the driving task. When pulling a trailer or transporting heavy cargo, drivers must avoid abrupt maneuvers and never jerk the steering wheel. All turns must be smooth and precise.

Leading accident causes:

- **Failure to follow procedures**
- **Inadequate PMCS**
- **Failure to maintain control**
- **Environmental/road conditions**

Environmental/road conditions

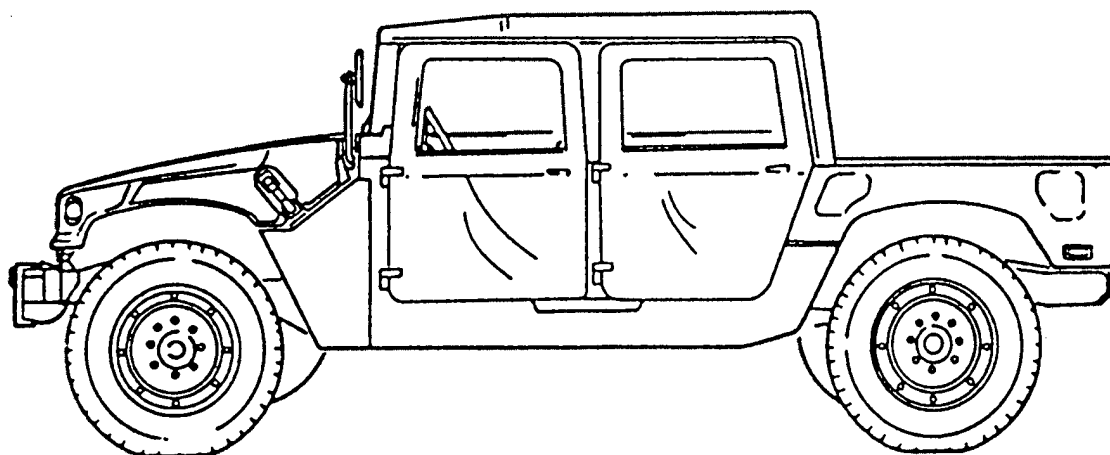
Easy-does-it is the rule when driving in rain, snow, or mud. These conditions require slower speed because of reduced visibility and increased stopping distances. Tank trails present the additional hazard of shoulder edges that can give way under the weight of the vehicle.

References

TM 9-2320-209
TM 9-2320-211
TM 9-2320-260
TM 9-2320-272
FC 55-32

Safety Belts Save Lives

HMMWV



The M998 series high mobility multipurpose wheeled vehicle was designed to meet light wheeled vehicle requirements of the battlefield of the 1980s and beyond. A 4x4 1-ton vehicle, the HMMWV consists of a common chassis that accepts various body configurations to accomplish combat, combat support, and combat service support roles.

Failure to follow procedures/inadequate training

Many times failure to follow procedures is related to insufficient training; drivers don't follow the procedures because they don't know the procedures. In other cases, drivers don't follow procedures because the requirement is not enforced. For example, disregard of the requirement to wear safety belts is one failure to follow procedures that calls for strong command action.

Each tactical vehicle requires training in its own unique handling characteristics. Especially important is training in emergency procedures—what to do if the vehicle gets off the roadway, or if another vehicle or other obstacle suddenly appears just ahead. The common panic reactions—to slam on the brakes or jerk the steering wheel to the right or left—cause accidents.

The HMMWV's most troublesome feature is its width. Drivers must learn to make more allowance for obstacles or roadway edges on the right than with most other vehicles.

Excessive speed

The speed limit in effect on a particular road or range is a maximum. Drivers should reduce speed—

Leading accident causes:

- **Failure to follow procedures/inadequate training**
- **Excessive speed**
- **Failure to use ground guide/improper ground guiding**
- **Failure to compensate for restricted visibility**

- In open country.
- On unpaved rough roads.
- On winding roads.
- When approaching curves and corners.
- After dark, especially while using night vision devices.
- In rain, snow, sleet, dust, or fog and when the road is slick.
- When traffic is heavy.
- Any time driving conditions are not ideal.

Failure to use ground guide/improper ground guiding

Ground guides are usually associated with larger trucks, but experience has shown that

when backing or maneuvering in a close space the HMMWV needs a ground guide too, because of its width and blind spots. A word of caution: The ground guide should never place himself between the vehicle and another object.

Failure to compensate for restricted visibility

Accidents occur when the HMMWV collides with a stationary vehicle or flips into a ditch because the driver simply did not see it. Factors affecting visibility may be darkness, blackout drive, thick dust, precipitation, or a combination of these.

Any time a driver can't see a stopped tank

or a deep ravine, it is probable he can't see much of anything. When that's the case and the driver must keep moving anyway, he should drive as though surrounded by unseen obstacles and pitfalls, because he is. He should—

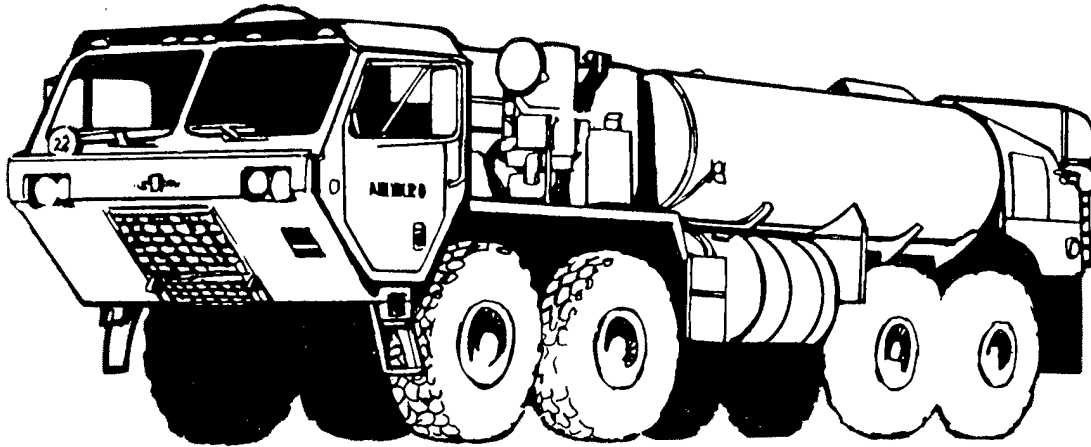
- Slow to 5 mph or less.
- Have all vehicle occupants help scan for hazards.
- Use a ground guide.

References

TM 9-2320-280
FC 55-32

Safety Belts Save Lives

HEMTT



The M977 series heavy expanded mobility tactical truck (HEMTT) is the new heavyweight on the block (62,000 to 95,000 pounds). It is used for direct rearming of the multiple launch rocket system, transport of Patriot erector/launchers, resupply of ammunition, and refueling of tracked and wheeled vehicles and aircraft in forward areas.

Failure to follow procedures/inadequate training

Many times, failure to follow procedures is related to insufficient training; drivers don't follow the procedures because they don't know the procedures. In other cases, drivers don't follow procedures because the requirement is not enforced. For example, disregard of the requirement to wear safety belts is one failure to follow procedures that calls for strong command action.

Each tactical vehicle requires training in its own unique handling characteristics. Especially important is training in emergency procedures—what to do if the vehicle gets off the roadway, or if another vehicle or other obstacle suddenly appears just ahead. The common panic reactions—to slam on the brakes or jerk the steering wheel to the right or left—cause accidents.

It's especially important to keep the HEMTT on the roadway, whether paved or tank trail. More often than not, a soft shoulder will give way under the weight of a HEMTT and the vehicle will roll over.

Leading accident causes:

- **Failure to follow procedures/inadequate training**
- **Excessive speed**
- **Inattention**
- **Failure to use ground guides**

Excessive speed

When thinking of excessive speed, most people visualize a vehicle traveling at 60 to 70 mph. Not true. With the HEMTT, speeds of only 25 to 30 mph can be too fast depending on road conditions, weather, and the load carried.

Inattention

Inadequate attention while following too closely is an accident waiting to happen, and a significant number of them do happen with HEMTTs—usually in convoys and involving two or more HEMTTs in a chain reaction.

Driving a HEMTT requires the driver's full attention. Drivers must discipline themselves

to concentrate on their driving and ignore potential distractions.

Failure to use ground guides

A ground guide is a must any time the HEMTT is being backed or operated in a congested area. The vehicle is over 9 feet tall, measures 8

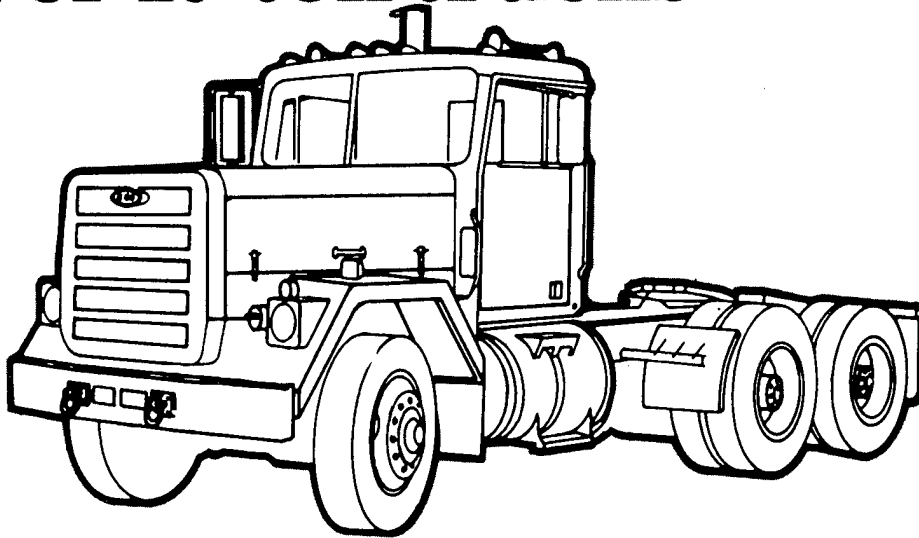
feet wide, and is 33.4 feet long. This is just too much vehicle for the driver to clear by himself.

References

TM 9-2320-279-10
FC 55-32

Safety Belts Save Lives

Over 10-ton trucks



The M915 line haul tractor truck pulls the M872 and other compatible semitrailers. It has a maximum towed load of 86,000 pounds and limited cross-country capability.

Inattention

Looking at the physical size of the tractor-trailer combination, it is obvious that the driving job requires the driver's full and full-time attention, and almost as much from the assistant driver. Once the driver loses control of this rig, it's unlikely he'll regain it. Long hauls should include arrangements for drivers to trade off so that driving stints coincide with a reasonable attention span and ability to concentrate.

Failure to follow procedures

Two types of violations are frequent causes of M915 accidents:

- Failure to use a ground guide during backing, or improper ground guiding. A word of caution: The ground guide should never place himself between the guided vehicle and another object.
- Failure to follow guidelines in the operators manual (TM 9-2320-273-10) for use of the engine retarder when descending steep grades. Every M915 operator must be thoroughly familiar with the procedures, which follow:

Proper downhill procedures

Note: Some of these actions may seem illogical or contrary to what your "common sense" would dictate, but *they are correct. Learn them thoroughly.* In an emergency situation, strict adherence to these procedures is essential.

Leading accident causes:

- **Inattention**
- **Failure to follow procedures**
- **Excessive speed**
- **Misjudged clearance**
- **Failure to maintain control**

Select a gear that, with the engine retarder applied, will allow the engine to control truck speed with engine rpm at or below 2000 and service brakes not applied. In other words, as you approach a downhill grade, progressively select a gear that, when combined with the engine retarder, will allow you to maintain an engine speed of 1750 to 2000 rpm.

As engine speed exceeds 2000 rpm, use one positive application of the service brakes to slow engine speed to 1650 rpm, release the engine retarder, downshift one gear, and reapply the engine retarder. Repeat this procedure until engine speed can be maintained between 1750 and 2000 rpm.

If the engine overspeeds (above 2100 rpm), make one positive application of the service brakes to slow vehicle speed.

If the transmission overspeeds (above 2300

rpm) and totally disengages, perform the following:

- Release engine retarder.
- Upshift.
- Make one positive application of the service brakes to slow the vehicle and regain control.

If the transmission totally disengages due to shifting with the engine retarder applied and engine speed has returned to low idle freewheeling, accelerate engine to re-engage transmission.

If total loss of braking occurs due to heat buildup—

- Apply engine retarder (place switch in high mode).
- Upshift as engine speed approaches 2100 rpm. Before each upshift, release engine retarder.
- In 16th gear, continue to apply engine retarder and maintain directional control of the vehicle.
- Don't panic!

Excessive speed

The tractor-trailer combination takes at least 72 feet to stop at 20 mph and twice as much at 30 mph. So drivers should leave *plenty* of room between them and the vehicle ahead. They should keep their speed moderate at all times to be prepared for sudden situations. In bad weather or traffic, they should reduce speed even more.

Misjudged clearance

This problem shows up often in turning corners. The minimum turning diameters range from 53 feet for the M915 with M872 semitrailer to 90 feet for the M920 with M870 semitrailer, so it's very risky to assume clearance between the tractor-trailer and nearby vehicles or objects. When in doubt, drivers should use a ground guide.

Another often-misjudged clearance is between the top of the load and a bridge or overpass. The driver must know the height of the load, and when traveling an unfamiliar route, the driver needs to be prepared to detour in case a too-low bridge is encountered. Of course it is best to check out the route beforehand whenever possible.

Failure to maintain control

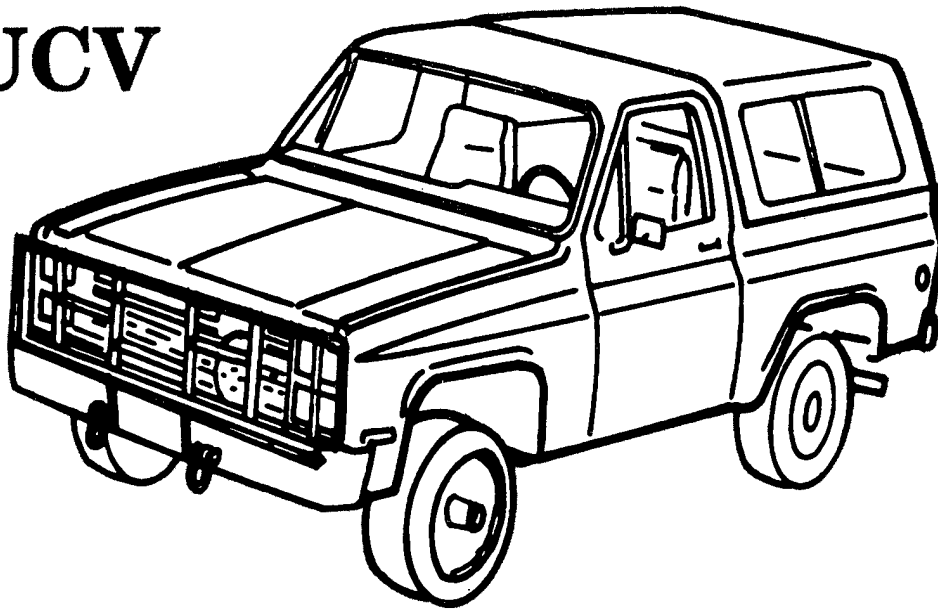
The best measure for prevention of these accidents is to ensure drivers are thoroughly trained in all aspects of handling the vehicle, including emergency procedures. They should refresh their memories by reviewing the operators manual periodically.

References

TM 9-2320-273-10
FC 55-32

Safety Belts Save Lives

CUCV



The M1031 series commercial utility cargo vehicles (CUCVs) are $\frac{3}{4}$ - and 1-ton tactical trucks. The utility version looks like the commercial Blazer. Because CUCVs make up almost half of the light vehicle fleet and get heavy use, they are involved in more accidents than most other tactical vehicles. However, because they are equipped with both lap and shoulder belts, injuries in CUCV accidents are relatively few and minor.

Excessive speed

The speed limit in effect on a particular road or range is a maximum. Drivers should reduce speed—

- In off-road operations.
- On unpaved or rough roads.
- On winding roads.
- When approaching curves and corners.
- After dark, especially while using night vision devices.
- In rain, snow, sleet, dust, or fog and when the road is slick.
- When traffic is heavy.

Any time driving conditions are not ideal.

Failure to follow procedures/inadequate training

Many times failure to follow procedures is related to insufficient training; drivers don't follow the procedures because they don't know the procedures. In other cases, drivers don't follow procedures because the requirement is not enforced. For example, disregard of the requirement to wear safety belts is one failure to follow procedures that calls for strong command action.

This category also includes trying to make the vehicle do things it's not designed for, in disregard of the operators manual. Accident

Leading accident causes:

- Excessive speed
- Failure to follow procedures/inadequate training
- Inattention
- Materiel failure/inadequate PMCS

records show that some drivers have assumed the CUCV could go up hills and down dips at will, that it could maneuver just like the jeep. It can't.

Tactical vehicles require special driver training. The fact that a driver is licensed to drive commercial vehicles does not mean he'll be able to handle all the situations and conditions he may encounter off the public roads.

Inattention

This cause factor is common for vehicle accidents in general. Operating a vehicle requires the driver's full attention. Drivers

must learn to discipline themselves to concentrate on driving and leave everything else to a more appropriate time.

Materiel failure/inadequate PMCS

These accident causes are closely related, since nearly all recorded materiel failures

could have been prevented by performing PMCS by the book.

References

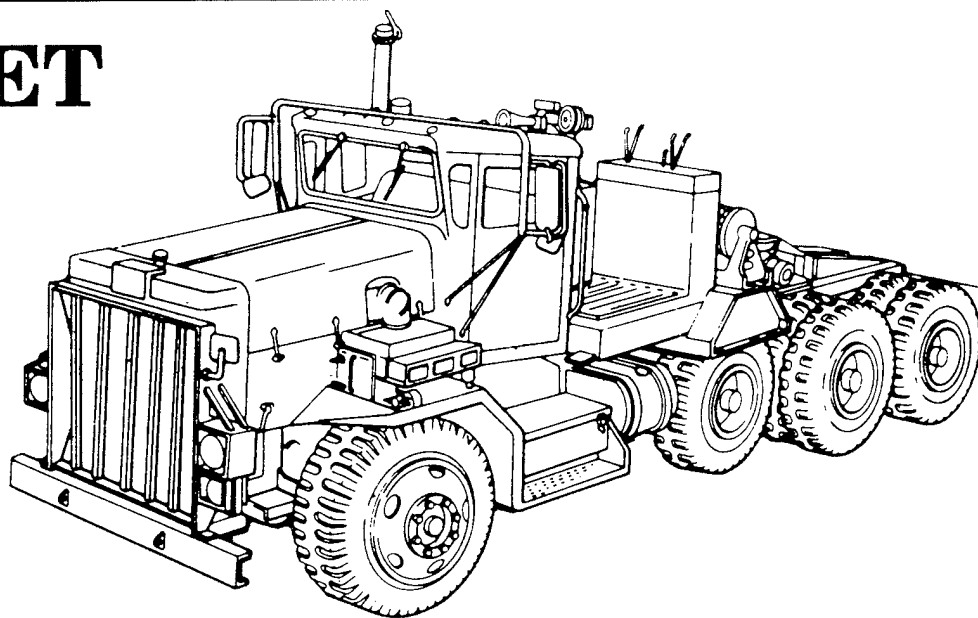
TM 9-2320-289-10

TB 9-2300-295-15/24

FC 55-32

Safety Belts Save Lives

HET



The M911 heavy equipment transporter pulls the M747 semitrailer with a 60-ton payload. Hauling tanks is the HET's prime mission.

Failure to clear

The HET with the M747 trailer attached is around 67 feet long and almost 11 feet high. It takes up a lot of space on the road.

- Check height and width clearance of bridges and overpasses. An inch can make a big difference.

- Make sure clearance is adequate before changing lanes and passing other vehicles.

- The HET needs more turning space than most other vehicles. The turn radius of the HET is 43 to 47 feet.

Following too closely/excessive speed

Tailgating with a HET is courting disaster. The HET weighs 39,952 pounds, and even at low speeds it takes some distance to stop. It takes even more with a loaded M747 trailer attached. For example, a HET with a 60-ton load going 20 mph needs about 80 feet to stop under ideal conditions.

- Keep a safe interval between the HET and the vehicle in front.

- Maintain safe vehicle speed.

- Remember that weight distribution affects stopping distance. Drivers must be aware that their cargo makes a difference.

- Use the hydraulic retarder to help slow the vehicle on downgrades or curves by releasing the accelerator and then depressing the retard pedal. You will get the best retarding effect in

Leading accident causes:

- **Failure to clear**
- **Following too closely/excessive speed**
- **Inadequate maintenance**
- **Inattention to ground guides**
- **Failure to obey traffic signals**
- **Improperly secured loads**

the lower forward transmission gear ranges. Caution: Long continuous use of the hydraulic retarder will raise transmission oil temperature and may cause damage to the transmission. To prevent overheating, fully release pedal for short periods and reapply as necessary.

Inadequate maintenance

There is no substitute for preventive maintenance checks and services (PMCS). Faulty brake systems and bad tires should be found during PMCS and corrective actions taken before the vehicle is driven. Drivers should also—

- Check for brake chatter, noise, and side pull.
- Check for proper operation of service and

parking brakes. If either is not operating properly, deadline the HET to ensure it's not driven until the problem has been corrected.

- While tires are cool, check for proper inflation pressure—95 psi for tires on front and pusher axles, and 85 psi for tires on tandem rear axles.
- Be sure to check spare tire.
- Check each tire for unusual wear or damage, objects stuck in tire walls or between treads, and presence of a valve cap.
- Check for loose, damaged, or missing wheel lug nuts.
- Check for damaged wheels, rims, and hubs.

Inattention to ground guides

A ground guide is a must more often for a HET than for other vehicles because it is more difficult to maneuver. A seemingly slight judgment error can be critical. Drivers should—

- Always use a ground guide when backing. If one is not available, the driver should walk around the tractor and trailer to see where and how close obstacles are.
- Always pay close attention to ground guides, but especially when backing, turning, or trying to squeeze through one of those narrow little streets in Germany.
- Never move a HET until certain they understand the ground guide's instructions.
- Stop immediately if they lose sight of the ground guide.

Failure to obey traffic signals

A surprising number of HET accidents have been caused by drivers failing to stop for a red

light. Since the HET has such a long stopping distance, drivers should—

- Start watching a traffic light as soon as it comes into view.
- Be prepared to stop even when the light is green.
- Remember that convoys must comply with traffic signals and other traffic control devices unless proper civil or military authorities direct otherwise.

Improperly secured loads

Loads must be secured; they cannot be transported when simply parked on the trailer.

- Tiedowns must be strong enough to keep the load on the trailer in corners, up and down grades, or in a tilt position, as when the tractor/trailer wheels slip off the pavement.
- When the payload is equipped with a turret, the turret must be locked in position.

Operational cautions

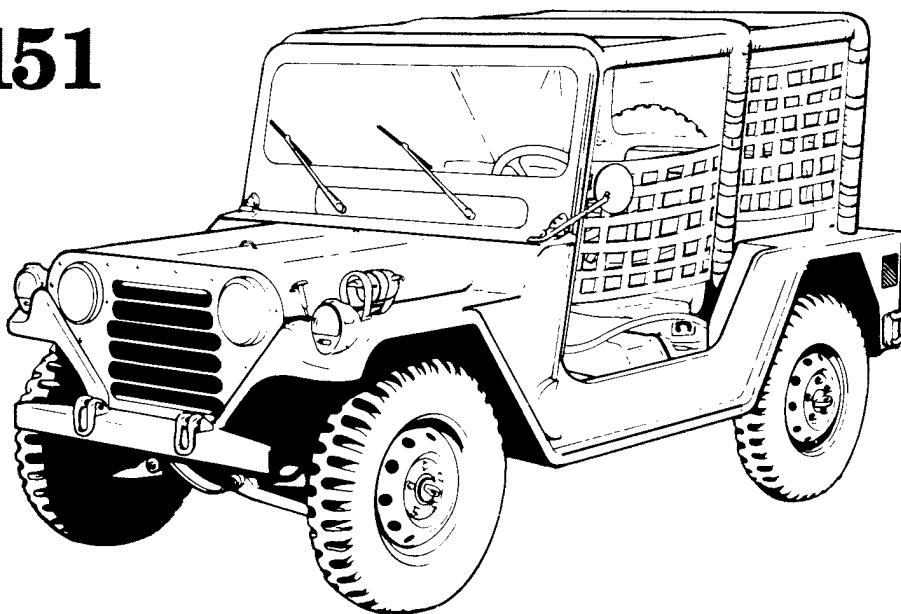
- Always wear safety belts.
- Don't permit anyone to stand directly behind the HET or trailer during coupling procedures.
- During winching operations, require everyone who isn't involved to stand clear of winches and payload.
- Personnel handling winch cables should wear heavy gloves and never allow the cable to run through their hands.

References

TM 9-2320-270-10
FC 55-32

Safety Belts Save Lives

M151



For years the M151 1/4-ton truck was involved in more accidents, usually with fatalities and injuries, than any other tactical vehicle. Since the installation of a rollover protection system (ROPS) and personnel restraint systems, there has been a dramatic reduction in fatalities and injuries.

Excessive speed

Excessive speed is the most frequent contributing cause of M151 rollover accidents. Attempting a turn at a speed excessive for conditions too often results in another M151 rollover accident. Drivers must be warned again and again of these three factors—speed, turns, and rollovers.

The operators manual, TM 9-2320-218-10, warns: "... M151 series vehicles ... have more responsive steering and acceleration than other vehicles. Watch speed, especially on turns. A full right or left turn at speeds over 20 mph (32km/h) can cause any vehicle to go out of control and/or turn over."

An Army technical bulletin, TB 9-2320-218-10-1, puts the case even more forcefully: "All models of 1/4-ton trucks have a short wheel base and a high center of gravity for cross-country mobility. Operation of these vehicles at high speeds, combined with sharp turns, can result in rollovers. The M151 has independent wheel suspension and gives little warning to the driver by body tilt or 'feel' if he is turning too fast. With independent wheel suspension, the rear inner wheel has a tendency to lift from the road, and the rear end breaks away to the outside of the curve. To

Leading accident causes:

- Excessive speed
- Failure to follow procedures/inadequate training
- Inattention
- Failure to clear

correct this condition, the driver must apply less steering turn and reduce speed."

The maximum operating speeds stated in the TM are only guides to the mechanical capacity of the vehicle in each gear ratio. Maximum safe speed is not determined by the figures on the data plate or on a chart in the TM. Road conditions, weather, visibility, and loading determine the speed at which an M151 should be driven.

Failure to follow procedures/inadequate training

Many times failure to follow procedures is related to insufficient training; drivers don't follow the procedures because they don't know the procedures. In other cases, drivers don't follow procedures because the requirement is

not enforced. For example, disregard of the requirement to wear safety belts is one failure to follow procedures that calls for strong command action.

Each tactical vehicle requires training in its own unique handling characteristics. Especially important is training in emergency procedures—what to do if the vehicle gets off the roadway, or if another vehicle or other obstacle suddenly appears just ahead. The common panic reactions—to slam on the brakes or jerk the steering wheel to the right or left—cause accidents.

Inattention

Operating the M151 requires the driver's full attention to anticipate turns in time to slow the vehicle to a speed that is safe for the conditions. Drivers must drive defensively and be constantly aware of changing road and traffic conditions.

Failure to clear

This occurs when drivers are so intent on backing up, changing lanes, or making turns that they forget to ensure the way is clear of other vehicles, signs, or other obstacles before making their move. Backing an M151 does not ordinarily require a ground guide, but like turning and lane-changing, it does require a thorough scan in all directions, including the mirror and blind spot.

Operational cautions

Commanders and supervisors should ensure all M151 drivers are thoroughly trained to drive the vehicle and are taught its characteristics.

In addition to the operators manual, the Army published TB 9-2320-218-10-1 to help train drivers in the safe operation of the M151. The TB lists two training films, TF 55-3707 (Operation of the M151¹/₄-Ton Utility Truck) and TF 55-4247 (Truck, Utility, ¹/₄-Ton M151A2, Characteristics and Handling). Periodic review of these films can keep drivers aware of the special characteristics of the M151.

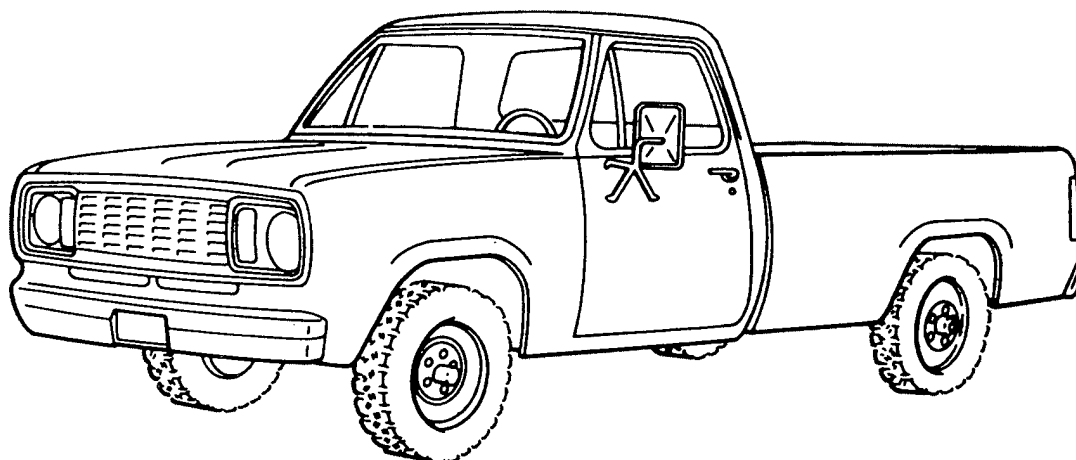
Since the giant safety step of equipping the M151 with a ROPS, the annual toll of rollover fatalities is a thing of the past. There have been several disabling injuries to personnel who failed to use safety belts (in violation of AR 385-55) and hit their heads on the rollbar. The first rollover fatality in a ROPS-equipped M151 was a passenger who slammed into the windshield because he had failed to buckle up.

References

TM 9-2320-218-10
TB 9-2320-218-10-1
FC 55-32

Safety Belts Save Lives

M880/890 trucks



The M880/890 series 1-ton trucks are modified commercial vehicles. The M880 was one of the first tactical vehicles equipped with safety belts.

Excessive speed

The posted speed limit on a particular road or range is a maximum. Drivers should reduce speed—

- In off-road operations.
- On unpaved or rough paved roads.
- On winding roads.
- When approaching curves and corners.
- After dark, especially while using night vision devices.
- In rain, snow, sleet, dust, or fog, and when the road is slick.
- When traffic is heavy.
- Any time driving conditions are not ideal.

Failure to follow procedures/inadequate training

Many times failure to follow procedures is related to insufficient training; drivers don't follow the procedures because they don't know the procedures. In other cases, drivers don't follow procedures because the requirement is not enforced. For example, disregard of the requirement to wear safety belts is one failure to follow procedures that calls for strong command action.

Each tactical vehicle requires training in its own unique handling characteristics. Especially important is training in emergency procedures—what to do if the vehicle gets off the roadway, or if another vehicle or other obstacle suddenly appears just ahead. The

Leading accident causes:

- **Excessive speed**
- **Failure to follow procedures/inadequate training**
- **Failure to clear**
- **Inattention**

common panic reactions—to slam on the brakes or jerk the steering wheel to the right or left—cause accidents.

Failure to clear

This occurs when drivers are so intent on backing up, changing lanes, or making turns that they forget to ensure the way is clear of other vehicles, signs, or other obstacles before making their move. Backing an M880 does not ordinarily require a ground guide, but like turning and lane-changing, it does require a thorough scan in all directions, including the mirrors and blind spot.

Inattention

Driving an M880/890 series truck requires the driver's full attention. Drivers must discipline themselves to concentrate on their driving and

leave everything else to a more appropriate time.

References

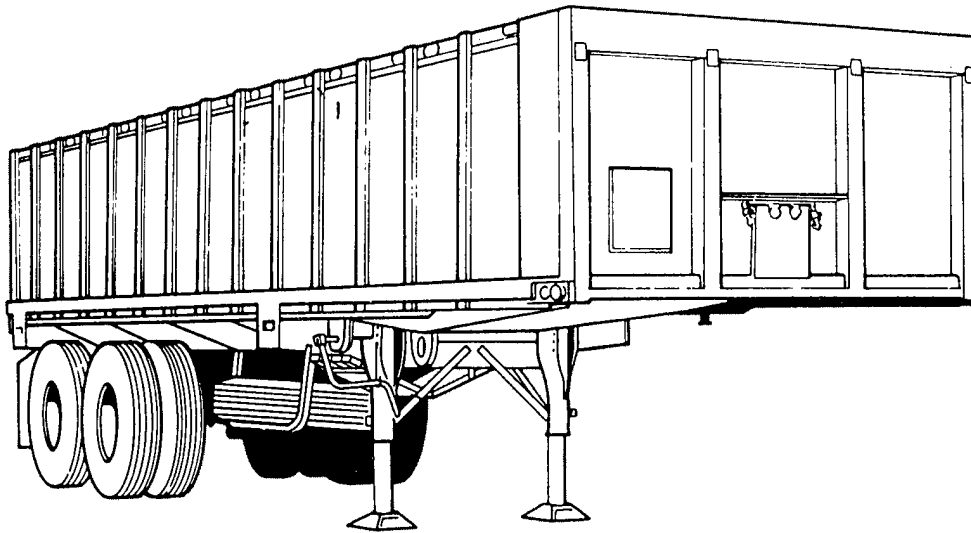
TM 9-2320-266-10

TM 9-2320-266-20

FC 55-32

Safety Belts Save Lives

Tactical trailers



The Army transportation system includes trailers from the $\frac{1}{4}$ -ton M416 series to the 60-ton M747 low bed semitrailer. Their uses are as diverse as their sizes. And their use demands drivers with special skills because towing a trailer of any size adds all sorts of complexities to driving a vehicle.

Materiel failure/inadequate PMCS

This type of problem appears to be more prevalent with trailers than with towing vehicles/prime movers. Even drivers who are conscientious about performing preventive maintenance checks and services (PMCS) on their vehicles sometimes forget that trailers require PMCS too.

Defects to be especially alert for (because they show up repeatedly as accident causes) are those involving—

- Wheels.
- Brakes.
- Brake lights.

Speed too fast for conditions

This factor shows up often because one of the "conditions" calling for reduced speed is simply having a trailer in tow. Adding reduced visibility, rain, snow, or a road full of potholes makes for a situation needing greatly reduced speed.

Trailer accidents often occur on curves or at corners. If the driver doesn't slow way down, the trailer is likely to fishtail and overturn or hit another vehicle or object.

Hit from the rear

This is a tough type of accident for the driver

Leading accident causes:

- **Materiel failure/inadequate PMCS**
- **Speed too fast for conditions**
- **Hits from the rear**
- **Failure to follow procedures/insufficient training**
- **Misjudged clearance**

towing the trailer to prevent. But trailers (usually stopped) being struck from behind happens so often that towing drivers should remain alert to the possibility. They should ensure the trailer brake lights work and should try to increase the visibility of the trailers. When traveling in a convoy at night or any time visibility is reduced, vehicles, including trailers, will be marked at the rear with reflective tape or paint in accordance with AR 55-29. It would be advisable to mark trailers in this manner whenever they travel on public highways even if they're not in a convoy. During blackout drive operations, special caution is needed to prevent rear-end

accidents, both on and off the road. Lights and reflectors should be kept clean.

If drivers have to pull off the road, it should be well off the road, and warning flags or reflectors put in place.

Failure to follow procedures/insufficient training

These factors are combined because they are closely related. Drivers may not know correct procedures or may not remember them in an emergency because of inadequate training, unfamiliarity with the operators manual, or simply inexperience.

Training is required for personnel to be licensed to drive a tractor-trailer combination. But the need for training is often overlooked when drivers are assigned to tow tactical trailers. It is a mistake for drivers or their supervisors to assume that driving a truck with a trailer in tow is the same as driving a truck without. It isn't. With a trailer hitched on, it is necessary to drive slower, turn and back differently, and drive even more

defensively, especially in relation to trailing vehicles.

In short, tactical trailer towing requires training.

Misjudged clearance

This problem shows up often in turning corners. It's risky to assume clearance when pulling a trailer because turning is simply going to take more room than it does with just the truck or tractor. Slow *way* down and, when in doubt, use a ground guide.

Another often-misjudged clearance is between a semitrailer and a bridge or overpass. The driver must know the height of his trailer or load, and when it is to be transported over an unfamiliar route, he needs to be prepared to detour in case he encounters a too-low bridge. Of course, it is best to check out the route beforehand whenever possible.

References

TM 9-2330-series
AR 55-29

Safety Belts Save Lives

Section VI

QDR/EIR Makes a Difference

Every Army publication sooner or later exhorts its readers to "send in those QDRs/EIRs." So, a soldier spots a problem and fills out an SF 368: Quality Deficiency Report/Equipment Improvement Recommendation (QDR/EIR). An acknowledgement of receipt and eventually a report of the action taken goes to the soldier. And changes are made. The system works.

Too often the reason you must live with a problem so long is that no one bothers to submit a QDR/EIR. Until a deficiency in equipment is known, it cannot be corrected. If an SF 368 is sent as a result of an accident, or is safety related, include the QDR/EIR number in block 33 of DA Form 285: U.S. Army Accident Investigation Report.

Your QDRs/EIRs do make a difference. Take a look at some changes the U.S. Army Tank-Automotive Command (TACOM) has made because of them.

Case 1

•**Problem.** M35A2 2-ton truck synchronizers, NSN 2520-00-752-1581, were either too thick or tapered at the wrong angle to match gears, causing a lockup.

•**Solution.** TACOM Engineering reviewed the QDR submitted and found that the crux of the problem was in the dimension between the two rings. This dimension did not exist on the drawings. TACOM Engineering revised the

drawings to show the distance between the two rings.

Case 2

•**Problem.** The ball studs in the steering lever assembly, NSN 2510-00-592-2258, of the M39 series 5-ton trucks would loosen and/or pull out, causing partial or complete loss of control. The ball studs were tapered and were not tight in the lever arm. If the ball stud ends did not protrude $\frac{1}{16}$ -inch through the lever arm, the ends could not be mushroomed against the lever arm to secure them in the assembly.

•**Solution.** The assembly and detailed drawings were updated to correct design errors and clarify notes to ensure machining, hardening, and securing the ball studs in the lever arms. Field users were given inspection and disposition procedures regarding defective steering lever assemblies.

Case 3

•**Problem.** The cargo body of the M884 1-ton truck with the S-250 shelter was breaking loose from the forward mounts. The shelter kit front tiedowns were connected to the cargo bed and not to the truck frame.

•**Solution.** The QDR not only stated the problem, it recommended the solution. The front tiedowns were anchored to the vehicle frame by extended bolts (through the body) attached to a piece of flat steel straddled underneath the frame rail.

Section VII

Media Products

AMV films

The following films can be useful in your driver training program. They are available at your local audiovisual support center.

SAVPIN 28676
TF 17-4484

Training Guides for Movement of Tactical Vehicles

Illustrates safety rules for moving tanks and trucks. Demonstrates day and night hand signals used by ground guides.

SAVPIN 30610
Videotape
936-061-0147F

Visual Hand Signals

Demonstrates hand signals for moving vehicles and helicopters during both day and night operations.

SAVPIN 32083
TF 9-6099

Safe Operation of the Gamma Goat Vehicle

Explains safe operation of the M561 1 $\frac{1}{4}$ -ton 6-wheel cargo and troop carrier designed to travel over rough terrain. Discusses special handling characteristics of the vehicle whose articulation system provides for steering both the front and rear wheels.

SAVPIN 53068
MMNS 246

Vehicle Operator Maintenance and Operation Procedures (Truck, Cargo, 1 $\frac{1}{4}$ -ton, M880)

Explains operational procedures of the cargo truck in various terrains and examines its capabilities in each.

SAVPIN 70430
TF(VT) 20-6275

Driving for the Army—A Job for Professionals

Covers vehicle maintenance, defensive driving, backing errors, off-post operations, and the effects of weather on driving.

SAVPIN 71932
Videotape
811-551-7855F

Motor Transport Operator

Soldiers will learn safety precautions for driving in snow and on ice as well as procedures for special conditions.

SAVPIN 29481
TF 55-3707

Operation of the M151 Series 1/4-ton Utility Truck*

Correct and safe procedures for operating M151 trucks, with focus on how to prevent oversteering and abrupt turns and proper steering in a skid.

SAVPIN 29516
TF 55-4247

Truck, Utility 1/4-ton M151A2, Characteristics and Handling*

Discusses operation of the M151A2 utility truck, and demonstrates its different uses.

MF 17-5934

GOER

Discusses operation of the GOER series of vehicles.

AFV 20-1
PIN 707998

Failure to Buckle Up

A 5-minute recreation of a jeep accident in which a soldier was killed when he hit the windshield because he didn't have his safety belt buckled.

AFV 20-3
PIN 708004

Fatal HMMWV Collision

A 4-minute recreation of an accident in which a soldier was killed when his HMMWV was hit from behind by another HMMWV while he was repairing the blackout drive lights on the front.

AFV 20-5
PIN 708402

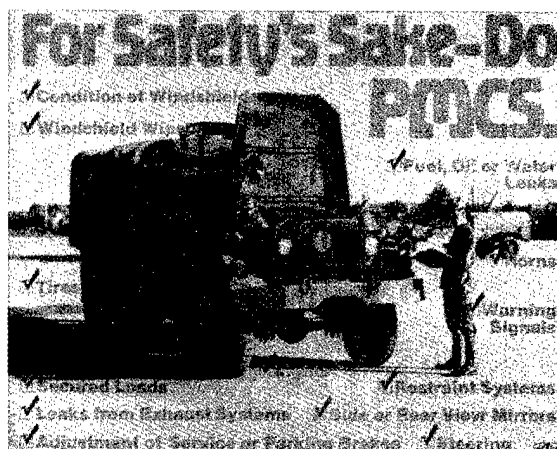
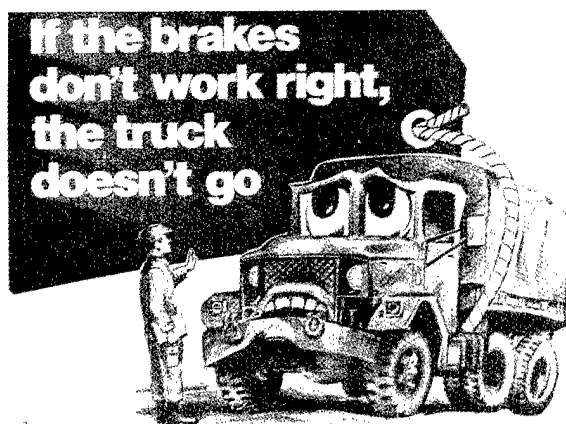
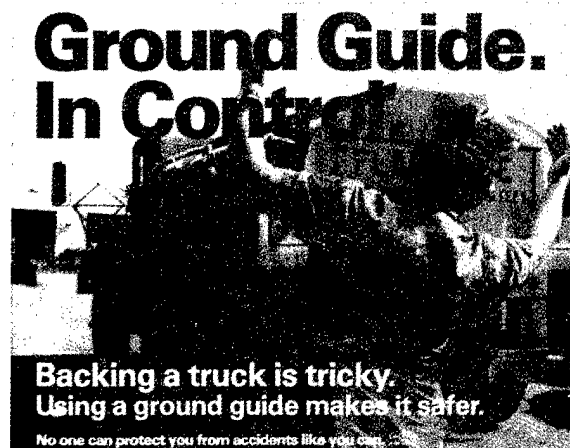
Unlicensed, Untrained Driver

A 5-minute video on leader failure. A soldier loses his life when his NCO allows an untrained, unlicensed driver to operate an Army truck.

*Required for drivers to be qualified on M151 trucks.

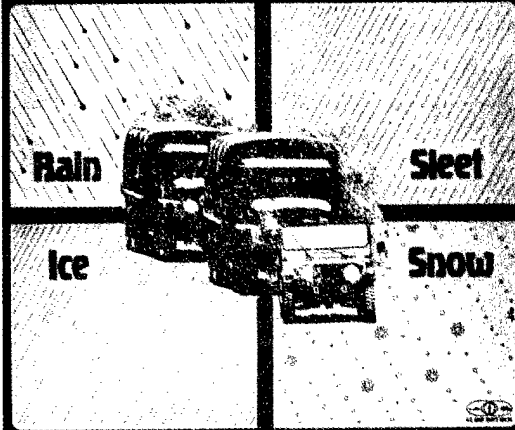
AMV posters

The following posters are available from the Army Safety Center. Mail requests to U.S. Army Safety Center, ATTN: CSSC-M (Distribution), Fort Rucker, AL 36362-5363.

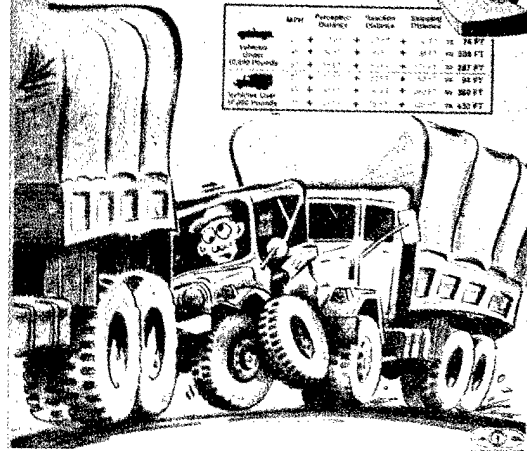


Bad Weather Reduced Visibility?

- Go Slow
- Brake Gently
- Increase Following Distance
- Be Alert
- Clear Windows



Following too Closely Becomes Costly.



Put Yourself In The Dead Man's Shoes

The driver of this jeep was speeding on a wet road at night. Driving too fast for conditions cost him his life.

Could This Be Your Accident?

CAN YOU STOP?



Do Your PMCS Brake Check EVERY DAY

Section VIII

Feedback

We are interested in your opinion of this AMV pamphlet. Please answer the following and return promptly. A self-addressed mailer appears on the back of this sheet for your convenience.

1. How useful is this pamphlet to you? (Circle one) Very Somewhat Not at all

2. Which section is most useful to you? _____

3. Which section is least useful to you? _____

4. What is your job title? _____

5. What is your pay grade? _____

6. Comments/recommendations: _____
